
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A fuel control system for optimizing the fuel efficiency of a combustion engine in a motor vehicle, said system comprising:

a plurality of sensors measuring a plurality of vehicle and engine operating conditions;

an electronic control module (ECM) coupled with said plurality of sensors and a fuel system of said combustion engine and configured to receive measurements of said plurality of vehicle and engine operating condition from said plurality of sensors and adjust fueling parameters of said fuel system to optimize fuel consumption of said combustion engine based on said measurements.

2. (Original) The fuel control system as recited in claim 1, wherein said plurality of vehicle and engine operating conditions include gross vehicle weight (GVW), vehicle road speed, road grade, engine speed, and engine temperature.

3. (Currently Amended) The fuel control system as recited in claim 1, wherein said ECM is configured to optimize fuel consumption through control of one or more of the following engine parameters: amount of air delivered to said fuel system, crankshaft position, engine timing, vehicle speed, engine output power, and fuel flow.

4. (Original) The fuel control system as recited in claim 1, wherein said measurements are made continuously in real-time.

5. (Currently Amended) The fuel control system as recited in claim ~~1~~ 4, wherein said ECM is configured to adjust said fueling parameters of said fuel system in real-time.

6. (Original) The fuel control system as recited in claim 3, wherein said measurements are made continuously in real-time.

7. (Currently Amended) The fuel control system as recited in claim ~~3~~ 6, wherein said ECM is configured to adjust said fueling parameters of said fuel system in real-time.

8. (Currently Amended) A method of controlling the fuel system of a combustion engine in a vehicle, said method comprising steps of:

(a) measuring a plurality of engine and vehicle operating conditions; and

(b) adjusting fueling parameters of said fuel system based upon the measurements made in step (a) to ~~optimize~~ control the output power of said engine ~~for maximum fuel efficiency~~ in order to achieve minimum fuel consumption.

9. (Original) The method as recited in claim 8, wherein said plurality of vehicle and engine operating conditions include gross vehicle weight (GVW), vehicle road speed, road grade, engine speed, and engine temperature.

10. (Original) The method as recited in claim 8, wherein in step (b), the fuel parameters being adjusted include an amount of air delivered to said fuel system, a crankshaft position, an engine timing, the vehicle speed, the engine output power, and fuel flow to the engine.

11. (Original) The method as recited in claim 8, wherein in steps (a) and (b) are performed in substantially real-time.

12. (Original) The method as recited in claim 9, wherein in step (b), the fuel parameters being adjusted include an amount of air delivered to said fuel system, a crankshaft position, an engine timing, the vehicle speed, the engine output power, and fuel flow to the engine.

13. (Original) The method as recited in claim 12, wherein in steps (a) and (b) are performed in substantially real-time.

14. (Original) A control system for a fueling system of a combustion engine comprising:

sensing means for measuring a plurality of engine and vehicle conditions in real-time;

a fuel map defining engine fueling parameters corresponding to engine operating conditions; and

a control module means for controlling fueling parameters of said fueling system by selecting fueling parameters from said fuel map based on engine operating conditions and adjusting the selected fueling parameters based on the plurality of engine and vehicle conditions measured by said sensing means.

15. (Original) The control system as recited in claim 14, wherein said plurality of vehicle and engine operating conditions include gross vehicle weight (GVW), vehicle road speed, road grade, engine speed, and engine temperature.

16. (Original) The control system as recited in claim 14, wherein said control module means controls an amount of air delivered to said fuel system, crankshaft position, engine timing, vehicle speed, engine output power, and fuel flow based on the adjusted fueling parameters

17. (Original) The control system as recited in claim 14, wherein said control module means adjusts said fueling parameters of said fuel system in real-time.

18. (Original) The control system as recited in claim 16, wherein said control module means adjusts said fueling parameters of said fuel system in real-time.

19. (Original) A control system for a fueling system of a combustion engine comprising:
sensing means for measuring a plurality of engine and vehicle conditions in real-time;
a plurality of fuel maps each optimized for a different set of engine and vehicle operating conditions; and
a control module for receiving the measurements from the sensing means, for selecting one fuel map from said plurality of fuel maps based on said measurements, and for controlling fueling parameters of said fueling system by selecting fueling parameters from said fuel map.

20. (Original) The control system as recited in claim 19, wherein said plurality of vehicle and engine operating conditions include gross vehicle weight (GVW), vehicle road speed, road grade, engine speed, and engine temperature.

21. (Original) The control system as recited in claim 19, wherein said control module controls

an amount of air delivered to said fuel system, crankshaft position, engine timing, vehicle speed, engine output power, and fuel flow based on the adjusted fueling parameters.

22. (Original) The control system as recited in claim 19, wherein said control module means adjusts said fueling parameters of said fuel system in real-time.

23. (Original) The control system as recited in claim 19, wherein said plurality of fuel maps are stored on a corresponding plurality of memory devices.

24. (Original) The control system as recited in claim 23, wherein said plurality memory devices comprise CD or DVD disks.

25. (New) The fuel control system as recited in claim 1, wherein said ECM is further configured to select a fuel map from a plurality of fuel maps which will optimize instantaneous fuel consumption based on said measurements.

26. (New) The fuel control system as recited in claim 1, wherein said ECM is further configured to calculate a position of minimum fuel consumption on a fuel map based on said measurements.

27. (New) The fuel control system as recited in claim 1, wherein said ECM is further configured to adjust fueling parameters of said fuel system to optimize fuel consumption, the optimum fuel consumption being a minimum fuel consumption without said combustion engine generating an exhaust that exceeds EPA regulations.

28. (New) The method as recited in claim 8, wherein said step (b) includes a step of selecting a fuel map from a plurality of fuel maps which will optimize instantaneous fuel consumption based on said measurements.

29. (New) The method as recited in claim 8, wherein said step (b) includes a step of calculating a position of minimum fuel consumption on a fuel map based on said measurements, and adjusting fueling parameters based on the calculated position.

30. (New) The method as recited in claim 8, wherein step (b) includes a step of limiting optimum fuel consumption to a minimum fuel consumption without said combustion engine generating an exhaust that exceeds EPA regulations.